

CHAPTER 4

Issue Identification

INTRODUCTION

This chapter discusses water supply related issues associated with meeting the 2025 projected water supply needs of the Upper East Coast (UEC) Planning Area. There are many activities currently underway that are addressing these issues, and several others proposed in this Plan. These activities and recommendations will be discussed in **Chapters 5 and 6**.

Several water supply issues were identified in the 2004 Update based on the analysis described in **Chapter 3**, if increased reliance on historically used sources of water were to continue from 1990 demand levels in the UEC Planning Area. The analysis indicated that the Surficial Aquifer in the coastal areas and surface water in the western portions of the planning area would not be adequate to meet the growing needs of the UEC Planning Area during a 1-in-10 year drought condition. Potential impacts on wetlands, as well as the potential for saltwater intrusion, increased using projected demand levels. A more detailed discussion of these follows. However, these problems would not occur in reality; a water use permit would not authorize withdrawals from the Surficial Aquifer if it was determined that withdrawals would cause harm to the resources. In fact, in some areas of the planning area, the use of the Surficial Aquifer has decreased from 1990 levels.

There are also significant riverine and estuarine systems in the planning area. Notably, the St. Lucie River and Estuary, Indian River Lagoon and the Loxahatchee River have unique supply issues. Freshwater discharges from the local watersheds to the St. Lucie River and Estuary and the Indian River Lagoon are problematic in maintaining a healthy estuarine system. The timing and volume of these discharges may have important water supply implications. In addition, large freshwater releases from Lake Okeechobee via the C-44 Canal have a dramatic effect on water quality, including salinity and health of the estuarine system. The Loxahatchee River has been significantly impacted by the creation and maintenance of the Jupiter Inlet, which has contributed to the displacement of freshwater wetland communities by estuarine species. In addition, construction of the C-18 Canal and installation of drainage projects for agricultural and urban development have lowered water tables and reduced the amount of fresh water available to the Loxahatchee River, which have significantly altered natural flow patterns. Efforts are underway in both of these systems' watersheds to address the freshwater flow regimes. The District has initiated rulemaking for the Northwest Fork of

the Loxahatchee River reservation and will begin the same process for the initial reservation for the St. Lucie River and southern Indian River Lagoon in 2004.

UEC WATER SUPPLY ISSUES

Following is a summary of water supply issues in the UEC Planning Area, as well as a map generalizing the aerial extent of some of these depicted in **Figure 7**. **Figure 7** is a compilation of Figures 7, 9 and 10 from the 1998 Plan. Each of these issues is discussed in greater detail following the list.

- Increased withdrawals from the Surficial Aquifer System are limited due to potential impacts on wetlands, as well as the increased potential for saltwater intrusion.
- Surface water availability in the C-23, C-24 and C-25 canals is not sufficient to meet existing and projected agricultural demands.
- Freshwater discharges (minimums and maximums) are affecting the health of the St. Lucie River and Estuary, southern Indian River Lagoon and the Northwest Fork of the Loxahatchee River.

These issues are generally the same as those issues identified in the 1998 Plan. The 1998 Plan identified several strategies, including development of alternative water supplies, to avoid these potential problems. As presented in **Chapter 3**, implementation of recommendations in the 1998 Plan is well underway, including increasing conservation efforts, the use of alternative water supplies and surface water storage and management.

Increased Withdrawals from Surficial Aquifer System Limited

As noted previously, the analyses conducted for the 1998 Plan indicated that the Surficial Aquifer could not support the projected urban water demands much beyond 1990 demand levels, primarily public water supply and landscape irrigation demands (recreational self-supply). Expansion of Surficial Aquifer withdrawals continues to be limited due to potential impacts to wetlands, as well as the increased potential for saltwater intrusion. The Surficial Aquifer is the primary source of water for public water supply and urban landscape irrigation.

Public Water Supply

The analyses concluded that public water supply could not continue to rely solely on the Surficial Aquifer to meet future demands. However, the analyses concluded that future public water supply demands could be met with a combination of Surficial Aquifer water and Floridan Aquifer water without causing harm to the water resources during a 1-in-10 year drought condition. One of the model simulations completed for the 1998 Plan considered a scenario wherein all the 2020 public water supply demands (existing

and projected—64 MGD) were transferred to the Floridan Aquifer. This is in addition to meeting the supplemental water needs (125 MGD) of agricultural users during a 1-in-10 year drought event.

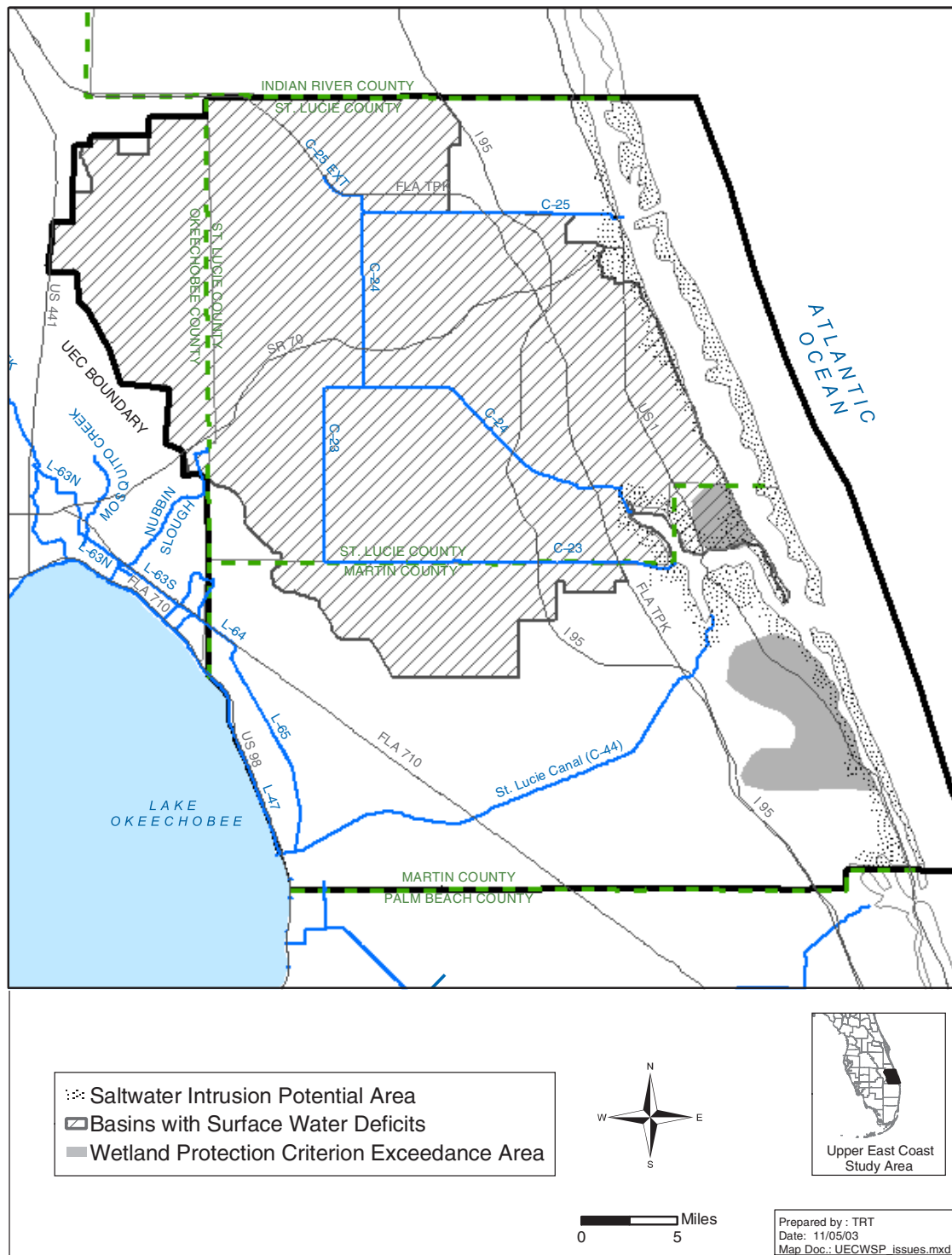


Figure 7. 1998 Upper East Coast Water Supply Plan 2020 Generalized Base Case Potential Supply Issues.

Landscape Irrigation

The analyses concluded that landscape irrigation (recreational self-supply water use category) could not continue to rely solely on the Surficial Aquifer to meet future demands. However, it was also concluded from the analyses that these demands could be met with a combination of Surficial Aquifer water and reclaimed water. Additional localized development of the Surficial Aquifer could be accomplished through modifications to wellfield configurations and pumping regimes with respect to locations of wetlands and salt water. Additional withdrawals from the Surficial Aquifer in these coastal areas will require evaluation on a project-by-project basis. Increases in the use of reclaimed water are expected as the region continues to develop.

Surface Water Availability in the C-23, C-24 and C-25 Canals

The results of the surface water budget analysis in the 1998 Plan verified that the surface water availability during a 1-in-10 year drought condition under the existing canal and storage network is not adequate in the C-23, C-24 and C-25 canals to support existing or projected agricultural water supply demands. However, the historical practice of supplementing surface water supplies with groundwater sources during dry periods, primarily the Floridan Aquifer, was shown to meet existing and future demands. Recent changes in economic conditions within the citrus industry prompted reassessment of the moderate increases in irrigated agricultural acreage projections in the 1998 Plan. Little, if any, growth from 2000 agricultural demand levels is expected.

Construction of storage reservoirs associated with the CERP Indian River Lagoon – South Project will enhance surface water availability, further assuring the needs of the agricultural community, as well as reducing the need for discharges to the estuarine systems.

Freshwater Discharges to Coastal Resources

Existing freshwater flow regimes (minimums and maximums) are affecting the health of the St. Lucie River and Estuary, southern Indian River Lagoon and the Northwest Fork of the Loxahatchee River. Minimum flows and levels have been approved for each of these including development of prevention and recovery strategies, where appropriate. Efforts are underway to create storage in each of these watersheds to better control freshwater discharges and create flow regimes (and salinities) to better support these systems.



St. Lucie River, Roosevelt Bridge

Most of the freshwater inflows to these coastal resources are rainfall driven due to the lack of adequate storage in the watersheds to these systems. Development in the watersheds has reduced historical natural storage areas. This reduction in storage has affected both the timing and volume of inflows. As a result, these systems receive significant inflows in a short period of time during rain events, and very little inflow during dry periods.

As discussed in **Chapter 3**, minimum flows and levels (MFLs) have been established for two natural systems in the UEC Planning Area: the St. Lucie River and Estuary and the Northwest Fork of the Loxahatchee River. Minimum flows and levels for the Loxahatchee River tributaries (Cypress Creek, Hobe Grove Ditch, Kitching Creek and the Loxahatchee Slough) are scheduled to be established in 2007. There are significant efforts underway to create storage in these watersheds and development of rainfall-driven schedules to make meaningful and beneficial water deliveries address maximum flows to these systems.

St. Lucie River and Estuary

Establishing a minimum flow and level alone is not sufficient to maintain a sustainable resource during the broad range of water conditions occurring in the managed system. For the St. Lucie River and Estuary, extended periods of large volume, freshwater flows also impact the resource. Setting a minimum flow is viewed as a starting point to define minimum water needs necessary to protect water resources from significant harm. Within the watershed, the timing and volume of freshwater flows to the St. Lucie River and Estuary have been dramatically changed from historical conditions with land development and canal construction.

The St. Lucie Estuary watershed covers an area of approximately 775 square miles. Three of its major drainage basins are now linked to the estuary by the C-23, C-24 and C-44 canals. The canals convey stormwater runoff from within these basins to the St. Lucie River and Estuary. In addition, the C-44 Canal conveys flood control discharges from Lake Okeechobee to the South Fork of the St. Lucie River. The C-25 Canal and watershed are located in northern St. Lucie County and runoff carried by the canal is discharged directly to the Indian River Lagoon near Fort Pierce Inlet.

The combination of these drainage modifications with land use intensification in the St. Lucie Estuary watershed has dramatically increased wet-season flows to the estuary and significantly reduced dry-season inflows. The reduction of the dry season base flows to the estuary impacts habitats and organisms dependent on brackish or freshwater areas during their life cycle. High volume stormwater discharges produce rapid fluctuations of



North Fork St. Lucie River

salinity, as well as sedimentation. The increase in nutrient and sediment loading has contributed to the build-up of fine-grained, nutrient-rich muck in the estuary. The resultant change in aquatic communities within the estuary consists of more pollutant tolerant benthic organisms and decreases in seagrass and oyster communities.

Construction of storage in the watershed is necessary to capture water during periods of rainfall to reduce peak discharges and maintain salinities within an acceptable range. Implementation of the CERP Indian River Lagoon – South and the Ten Mile Creek projects will provide needed storage to reduce maximum discharges from the watershed to the St. Lucie River and Estuary.

The Project Implementation Report (PIR) for the CERP Indian River Lagoon – South Project presently indicates the District will adopt initial reservations of existing water for the protection of fish and wildlife for the St. Lucie River and southern Indian River Lagoon. The process for adopting these reservations is expected to begin in 2004 and is anticipated to occur over an approximate two-year period.

Additionally, and prior to execution of the Project Cooperation Agreement (PCA), the District will reserve water made available by the CERP Indian River Lagoon – South Project for protection of fish and wildlife. Presently, staff expects execution of the PCA to occur in approximately 2006.

Northwest Fork of Loxahatchee River

The Loxahatchee River has been significantly impacted by the creation and maintenance of the Jupiter Inlet, which has contributed to the displacement of freshwater wetland communities by estuarine species. In addition, construction of the C-18 Canal and installation of drainage projects for agricultural and urban development have lowered water tables and reduced the amount of fresh water available to the Loxahatchee River, which has significantly altered natural flow patterns.

The minimum flow and level for the Northwest Fork of the Loxahatchee River was developed to protect the remaining floodplain swamp community and downstream estuarine resources from significant harm. A restoration plan is being developed. The restoration plan will address the flow regime to the river using a watershed approach. Restoration will include development of goals and targets; construction of the CERP components in northern Palm Beach County and southern Martin County, establishment of minimum flows and levels for contributing tributaries to the river and water reservations. The SFWMD Governing Board authorized initiation of rule development in April 2004 for an initial reservation for the Northwest Fork of the Loxahatchee River. The CERP based project component water reservations will follow construction of the project, and overall water reservations will follow completion of all activities. Establishment of minimum flows and levels for the Loxahatchee River tributaries (Cypress Creek, Hobe Grove Ditch, Kitching Creek and the Loxahatchee Slough) are scheduled for 2007.

The SFWMD Governing Board accepted the Northern Palm Beach County Comprehensive Water Management Plan in May 2002. The plan proposed 48,000 acre-feet of storage conceptually located in the L-8 Basin (L-8 Reservoir). The District has purchased approximately 44,800 acre-feet of storage in the L-8 Reservoir. Construction of the G-160 Loxahatchee Slough Spillway Structure in northeastern Palm Beach County was completed in January 2004, which will provide essential freshwater flows to the Northwest Fork of the Loxahatchee River during the dry season and will also maintain a more natural hydroperiod within the slough.

In addition to these regional efforts, Martin County is involved in several projects to enhance water quality and expand wildlife habitat. These projects include Tropic Vista and Little Club, Pal-Mar/Cypress Creek/Hobe Grove, Cypress Creek, Pal-Mar East and Kitching Creek Restoration. These projects are described in **Chapter 5** of this document in the Surface Water section.

Chapter 5 presents water source options that were considered in this Plan including implementation strategies. **Chapter 6** contains recommendations for implementation of these strategies.

